CLAIMS

We claim:

A polyisocyanate composition comprising:

(1) a polyisocyanate; and

(2) a monomeric carbodiimide in amount effective in improving the humidity resistance ot the polyisocyanate.

2. The polyisocyanate composition of claim 1 wherein the polyisocyanate is polymeric diphenylmethylene diisocyanate.

3. The polyisocyanate composition of claim 2 wherein the monomeric carbodiimide is selected from the group consisting of N, N'-dicyclohexyl carbodiimide, N,N'-diisopropyl carbodiimide, N,N'-ditert-butyl carbodiimide, N,N'-di-p-tolyl carbodiimide, and mixtures thereof.

4. The foundry binder system of claim 3 wherein the amount of monomeric carbodiimide is from 0.1 weight percent to 5.0 weight percent, based upon the weight percent of the isocyanate component.

5. A foundry binder system comprising:

A. a phenolic resin component; and

B. a polyisocyanate component comprising:

(1) an organic polyisocyanate;

(2) a non reactive organic solvent; and

(3) a monomeric carbodiimide in amount effective in improving the humidity resistance ot the polyisocyanate.

6 The foundry binder system claim 5 wherein the phenolic resin component comprises a (a) a polybenzylic ether phenolic resin prepared by reacting an aldehyde with a phenol such that the molar ratio of aldehyde to phenol is from 1.1:1 to 3:1 in the presence of a divalent metal catalyst, and (b) a solvent in which the resole resin is soluble.

7. The foundry binder system of claim 6 wherein the phenol is selected from the group consisting of phenol, o-cresol, p-cresol, substituted phenols, and mixtures thereof.

8. The foundry binder system of claim 7 wherein the aldehyde is formaldehyde.

9. The foundry binder system of claim 8 wherein the ratio of hydroxyl groups of the polybenzylic ether phenolic resin to the polyisocyanate groups of the polyisocyanate hardener is from 0.80:1.2 to 1.2:0.80.

10. The foundry binder system of claim 5 where the monomeric carbodiimide is selected from the group consisting of N, N'-dicyclohexyl carbodiimide, N,N'-diisopropyl carbodiimide, N,N'-ditert-butyl carbodiimide, N,N'-di-p-tolyl carbodiimide, and mixtures thereof.

11. The foundry binder system of claim 10 wherein the amount of monomeric carbodiimide is from 0.1 weight percent to 5.0 weight percent, based upon the weight of the isocyanate component.

12. A foundry mix comprising:

A. a major amount of an aggregate; and

B. an effective bonding amount of the binder system of claims 5, 6, 7, 8, 9, 10, or 11.

13. A process for preparing a foundry shape which comprises:

(a) forming a foundry mix as set forth in claim 12;

(b) forming a foundry shape by introducing the foundry mix obtained from step (a) into a pattern;

(c) contacting the shaped foundry binder system with a tertiary amine catalyst; and

(d) removing the foundry shape of step (c) from the pattern.

14. The process of claim 13 wherein the tertiary amine catalyst is a gaseous tertiary amine catalyst.

15. The process of claim 14 wherein the amount of said binder composition is about 0.6 percent to about 5.0 percent based upon the weight of the aggregate.

16. The process of claim 15 wherein the tertiary amine catalyst is a liquid tertiary amine catalyst.

17. The process of casting a metal which comprises:

(a) preparing a foundry shape in accordance with claim 16;

(b) pouring said metal while in the liquid state into and a round said shape;

(c) allowing said metal to cool and solidify; and

(d) then separating the molded article.